IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.:	09/688,733	**Confirmation No.:**	3697
Applicant:	Yoshimasa Saito		
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Examiner:	Thoi V. Duong		
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Customer No.:	33448		

APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest is Sony Corporation as a result of transfer of all right, title and interest to the subject matter of this application Serial No. 09/688,733, via the Assignment recorded in the Patent Office in Reel 011-217 Frame 0303 on October 16, 2000.

II. RELATED APPEALS AND INTERFERENCES

Applicants and the undersigned are currently unaware of any related appeals and interferences to the instant Appeal.

III. STATUS OF CLAIMS

The claims currently stand in condition as modified by Amendment A dated November 7, 2000 canceling claims 5 and 14, and modifying the remaining claims, which has been entered by the Examiner, as well as Amendment B dated December 17, 2003

canceling claims 1, 2, 4, 8, 11, and modifying the remaining claims. Accordingly, claims 3, 6, 7, 9, 10, 12, and 13 are the only claims remaining, and stand in condition as set forth in the attached Appendix of Claims on Appeal.

IV. STATUS OF AMENDMENTS

All Amendments have now been entered as noted in the status of claims and none have been filed subsequent to the Amendment dated December 17, 2003

V. SUMMARY OF INVENTION

The invention of the instant application is directed to providing a liquid crystal display having improved viewing angle characteristics without causing a decline in the aperture ratio or a decline of transmissivity for the device. The present invention overcomes problems in prior art techniques such as those described with reference to Figure 7 on page 3 of the instant application wherein liquid crystal alignments are provided by dividing one single dot or pixel into two or four areas as shown in Figure 7 (this is described on page 4 beginning on line 12 of the specification). The prior art technique described above suffers from alignment disorder occurring at boundaries of the divided areas. The instant invention overcomes these shortcomings and deficiencies of the prior art.

More specifically, the main viewing angle direction of the entire liquid crystal display can be adjusted to an intended direction by dividing the alignment treatment of the liquid crystal alignment film on a transparent substrate while maintaining a unique alignment direction for the front and back films at each pixel or dot and differentiating alignment directions at least between two adjacent pixels so as to be able to obtain an intended main or

primary viewing angle direction. See specifically Applicants Summary of the Invention at page 5, lines 1-8.

In an exemplary embodiment, improved viewing angle characteristics can be obtained by performing adjustment of the main viewing angle direction at the dot level and not performing control of the main viewing angle for each pixel. See specifically page 5, lines 10-14. According to one aspect of the present invention, a liquid crystal display element includes a pair of transparent substrates and a liquid crystal sandwiched between the pair of substrates. The liquid crystal alignment films formed on the liquid crystal side surfaces of the transparent substrate are aligned corresponding to either a dot and/or a pixel. More specifically, the liquid crystal alignment directions at two dots and/or at two pixels differ from each other so that it is possible to obtain an intended main viewing angle direction. See specifically Applicants disclosure at page 6, lines 10-13.

Figure 1 shows a specific exemplary embodiment wherein four closely arranged pixels A-D (each pixel being comprised of a group of R-dot, G-dot and B-dot) are disposed in the delta arrangement so as to make the primary viewing angle directions up, down, left, and right as shown. See Applicant's specification at page 10 lines 20-25.

As shown in the illustration of Figure 1, for the pixels A-D, when the liquid crystal alignment direction of the lower substrate is adjusted to be the direction of the dotted line arrowhead, and the liquid crystal alignment direction of the upper substrate is adjusted to the direction of the full line arrowhead, the primary viewing angle direction for each of the pixels becomes the direction of each star (*) set forth in Figure 1. See specifically page 10, lines 25-31, and page 11, lines 1-5.

The specification also describes an alternate embodiment beginning on page 11 at line 15 with reference to Figure 2. As stated therein, Figure 2 illustrates an alternate example wherein the liquid crystal alignment directions are adjusted not by the pixel, but rather by each individual dot.

As shown in Figures 1 and 2 respectively by the two arrows for each of the dots or pixels, each of four closely arranged dots or four closely arranged pixels have two distinct different alignment directions for the respective front and back films and none of the closely arranged dots or pixels shares two common alignment directions. This language is set forth in claims 3 and 6, and specifically characterizes the alignment directions set forth in the illustrations of Figures 1 and 2 described on pages 10-11 of the specification. Furthermore, the pixels or dots only have the two alternate alignment directions for the front and rear alignment films without any additional alignment directions for the specific pixel or dot. See Figures 1 and 2, for example.

The specification beginning on page 12 describes a process for manufacturing the liquid crystal display having the alignment characteristics described with reference to Figures 1 and 2. The displays having the alignment film characteristics specified by the claims have improved viewing characteristics, yet do not suffer from the shortcomings of the prior art wherein divided pixels or dots are provided.

VI ISSUES PRESENTED FOR REVIEW

I. Whether the Chen United States Patent No. 6,097,463 provides the requisite teaching to anticipate claim 7 which specifies a display having one front and one back alignment direction for a pixel with no other alignment directions and adjacent pixels do not share two alignment directions.

II. Whether the Chen United States Patent No. 6,097,463 when considered in combination with the McCartney United States Patent No. 5,657,105 renders invalid as being anticipated or obvious the subject matter of claims 3, 6-7, 9-10, and 12-13.

VII GROUPING OF CLAIMS

Claims 3, 6, 7, 9, 10, 12, and 13 are the only claims pending in the application. Claims 3 and 9 stand together, claims 6 and 12 stand together, claims 7 and 13 stand together. Finally, claim 10 stands alone.

VIII ARGUMENT

Applicant respectfully submits that the prior art references of record, whether considered alone, or in combination, fail to either teach or suggest Applicant's presently claimed invention. Applicant notes that the references of record fail to provide any teaching or suggestion whatsoever regarding the specified liquid crystal display set forth in the groups of claims. As detailed below, the rejections set forth by the Examiner are improper.

A. The Cited References Fail to Teach of Suggest the Claimed Invention as specified in Claims 3 and 9.

Neither Chen alone nor the combination of Chen 6,097,463 when considered in combination with the McCartney United States Patent No. 5,657,105 provides the requisite teaching or suggestion for rendering the subject matter of claim 3 invalid as being obvious or anticipated.

Claim 3 specifies a liquid crystal display that is comprised of a pair of transparent substrates and each of the plurality of dot regions of the display has a first alignment direction for a front alignment film portion of the dot and a second alignment direction for a back alignment film portion of the dot with no other alignment directions for the dot. Furthermore,

four closely arranged dot regions each have two different alignment directions for the respective front and back alignment films and none of four closely arranged dot regions share two common alignment directions. Claim 9 is similar but specifies the manufacture of the display having the characteristics noted above. This device is illustrated in Figure 1 by the alignment directions set forth for the various dot regions referenced by the arrows. As noted above, this is described in the specification at page 10.

As shown in the illustration, and described in the written specification, each of the referenced dot regions has a first alignment direction for a front alignment film portion (the solid line arrows) and a second alignment direction for a back alignment film portion of the dot (the dotted line arrows) with no other alignment directions for the dot. The claim limitation directed to the lack of any other alignment directions for the dots distinguishes over references wherein dots or pixels are subdivided into separate regions each having their own alignment film directions. As noted above in the Summary of the invention section, dividing of pixels or dots in the manner specified causes serious problems for the resultant display. Applicant has overcome these problems by not dividing pixels or dots. Figure 8B of the Chen reference teaches one such device wherein pixels 141 are divided in that manner which is clearly distinct from the subject matter of this claim at least for this reason alone.

Furthermore, claims 3 and 9 specify that four closely arranged dot regions each have two different alignment directions for the respective front and back alignment films with none of four closely arranged dot regions sharing two common alignment directions. This is also shown in Figure 1 wherein some of the adjacent alignment films share a single common alignment direction but none of the pixels shares two common alignment film directions. For

example, the upper and right side dot share a single common direction (up and to the left) but none share two common directions as specified.

In contrast with the invention as specified in claims 3 and 9, the prior art Chen reference US. 6,097,463 merely teaches a divided pixel structure whereas as shown in Figures 2A and 2B, the alignment film directions for each pixel is split such that opposite alignment directions are provided within each pixel element for different portions thereof.

See specifically column 6 at lines 19-25 wherein the specification of Chen notes that in Figure 2A, the alignment directions of the liquid crystal in a pixel 24 are shown by arrows D. In contrast, with the subject matter of claims 3 and 9, the Chen reference merely teaches splitting pixels to thereby provide multiple alignment directions within each pixel as shown in Figure 8B or Figures 2A and 2B. In an alternate arrangement, individual pixels of Chen that are adjacent have opposite alignment film directions such as shown in Figure 5A or 5B. See specifically the description in the Chen reference at column 8, lines 25-55.

Additionally, the Chen reference notes that the adjacent pixels may have the arrangement described in Figure 8A wherein adjacent pixels have a single alignment film direction and adjacent pixels are opposite. Thus at best, Chen teaches that individual adjacent pixels may have opposite alignment film directions or that pixels may be divided as shown in Figures 2A and 2B, as well as 8B.

The significant deficiency of Chen with respect to claims 3 and 9 is that there is simply no teaching or suggestion whatsoever regarding a display wherein four closely arranged dot regions each have two different alignment directions for the respective front and back alignment films and none of the four dot regions share two common alignment

directions. None of the embodiments in Chen provide teaching or suggestion regarding these limitations.

In each of the embodiments described in Chen, there are notable deficiencies. First, in regard to the embodiments of Figures 1-4 wherein the pixels or dots are split to have distinct front and rear alignment directions, as shown specifically in Figure 2A and 2B, all adjacent or closely arranged dots and pixels would each share two common alignment directions because all pixels or dots would presumably have the same two opposite orientations. The Chen reference provides no teaching or suggestion to the contrary.

In the embodiments described in Chen wherein adjacent pixels may have opposite alignment directions such as shown in Figure 5 or 8A, the device of these embodiments does not include distinct alignment directions for the front and rear alignment films and there is no teaching or suggestion regarding modification that would so provide. Accordingly, the rejection is still improper as to these embodiments.

In regard to the embodiment of Figure 8B, there are multiple alignment directions for the front and rear alignment films but the embodiment of 8B teaches that there are more than two alignment directions for the pixel or dot. This is contrary to that portion of the claim that specifies only two distinct alignment directions for the pixel or dot and no more. Furthermore, for four closely arranged pixels illustrated in 8B there will always be pixels that share not just one but multiple alignment directions.

In summary, there are numerous deficiencies in the Chen reference. Chen merely teaches either dividing a pixel or dot or having opposite alignment directions for adjacent pixels. None of the embodiments of Chen provides the improved display device of the

present invention wherein improvements in the display viewing characteristics can be achieved without degrading other performance characteristics.

The same holds true for the McCartney reference U.S. 5,657,105 that merely teaches dividing a dot into two orientation directions Col. 2 lines 50-65. There is no teaching or suggestion in this reference regarding the two distinct front and rear orientation directions and wherein none of four closely arranged dot regions share two common alignment directions. In McCartney, they all share multiple common alignment directions. This causes a problem in that the resultant display is not able to provide the improved viewing characteristics at all angles of viewing as Applicants claimed device.

Accordingly, in light of the foregoing, neither cited reference alone, nor the combination of references asserted by the Examiner provides the requisite teaching to render obvious or anticipate the subject matter as set forth in claims 3 and 9. The rejection of these claims should therefore be withdrawn.

B. The Cited References Fail to Teach of Suggest the Claimed Invention as specified in Claims 6 and 12.

Neither Chen alone nor the combination of Chen and McCartney provides the requisite teaching or suggestion for invalidating claims 6 and 12. Claims 6 and 12 are similar to claims 3 and 9 but specify alignment directions for a pixel. Claim 12 specifies a method of manufacturing the device of claim 6.

Claims 6 and 12 specify a liquid crystal display that is comprised of a pair of transparent substrates and each of the plurality pixel regions of the display has a first alignment direction for a front alignment film portion of the pixel and a second alignment

direction for a back alignment film portion of the pixel with no other alignment directions for the pixel. Furthermore, four closely arranged pixel regions each have two different alignment directions for the respective front and back alignment films and none of the four pixel regions share two common alignment directions. This is illustrated in Figure 2 by the alignment directions set forth for the various pixel regions referenced by the arrows. As noted above, this is described in the specification at page 10.

As shown in the illustration, and described in the written specification, each of the referenced pixel regions has a first alignment direction for a front alignment film portion (the solid line arrows) and a second alignment direction for a back alignment film portion of the dot (the dotted line arrows) with no other alignment directions for the pixel. The claim limitation directed to the lack of any other alignment directions for the pixel distinguishes over references wherein dots or pixels are subdivided into separate regions each having their own alignment film directions. Figure 8B of the Chen reference teaches one such device wherein pixels 141 are divided in that manner which is clearly distinct from the subject matter of claims 6 and 12 at least for this reason alone.

Furthermore, claims 6 and 12 specify that four closely arranged dot regions each have two different alignment directions for the respective front and back alignment films with none of four closely arranged dot regions sharing two common alignment directions. This is also shown in Figure 2 wherein some of the adjacent alignment films share a single common alignment direction but none of the pixels shares two common alignment film directions. For example, the two right side pixels with arrows share a single common direction (up and to the left) but none share two common directions as specified.

In contrast with the invention as specified in claims 6 and 12, the prior art Chen reference US. 6,097,463 merely teaches a divided pixel structure whereas as shown in Figures 2A and 2B, the alignment film directions for each pixel is split such that opposite alignment directions are provided within each pixel element for different portions thereof.

See specifically column 6 at lines 19-25 wherein the specification of Chen notes that in Figure 2A, the alignment directions of the liquid crystal in a pixel 24 are shown by arrows D. In contrast, with the subject matter of claims 6 and 12, the Chen reference merely teaches splitting pixels to thereby provide multiple alignment directions within each pixel as shown in Figure 8B or Figures 2A and 2B. In an alternate arrangement, individual pixels of Chen that are adjacent have opposite alignment film directions such as shown in Figure 5A or 5B. See specifically the description in the Chen reference at column 8, lines 25-55.

Additionally, the Chen reference notes that the adjacent pixels may have the arrangement described in Figure 8A wherein adjacent pixels have a single alignment film direction and adjacent pixels are opposite. Thus, at best, Chen teaches that individual adjacent pixels may have opposite alignment film directions or that pixels may be divided as shown in Figures 2A and 2B, as well as 8B.

The significant deficiency of Chen with respect to claims 6 and 12 is that there is simply no teaching or suggestion whatsoever regarding a display wherein four closely arranged pixel regions each have two different alignment directions for the respective front and back alignment films and none of four closely arranged pixel regions share two common alignment directions. None of the embodiments in Chen provide teaching or suggestion regarding these limitations.

In each of the embodiments described in Chen, there are notable deficiencies. First, in regard to the embodiments of Figures 1-4 wherein the pixels or dots are split to have distinct front and rear alignment directions, as shown specifically in Figure 2A and 2B, all adjacent or closely arranged dots and pixels would each share two common alignment directions because all pixels or dots would presumably have the same two opposite orientations. The Chen reference provides no teaching or suggestion to the contrary.

In the embodiments described in Chen wherein adjacent pixels may have opposite alignment directions such as shown in Figure 5 or 8A, the device of these embodiments does not include distinct alignment directions for the front and rear alignment films and there is no teaching or suggestion regarding modification that would so provide. Accordingly, the rejection is still improper as to these embodiments.

In regard to the embodiment of Figure 8B, there are multiple alignment directions for the front and rear alignment films but the embodiment of 8B teaches that there are more than two alignment directions for the pixel or dot. This is contrary to that portion of the claim that specifies only two distinct alignment directions for the pixel or dot and no more. Furthermore, for four closely arranged pixels illustrated in 8B there will always be pixels that share not just one but multiple alignment directions.

In summary, there are numerous deficiencies in the Chen reference. Chen merely teaches either dividing a pixel or dot or having opposite alignment directions for adjacent pixels. None of the embodiments of Chen provides the improved display device of the present invention wherein improvements in the display viewing characteristics can be achieved without degrading other performance characteristics.

The same holds true for the McCartney reference U.S. 5,657,105 that merely teaches dividing a dot into two orientation directions Col. 2 lines 50-65. There is no teaching or suggestion in this reference regarding the two distinct front and rear orientation directions and wherein none of four closely arranged pixel regions share two common alignment directions. In McCartney, they all share multiple common alignment directions. This causes a problem in that the resultant display is not able to provide the improved viewing characteristics at all angles of viewing as Applicants claimed device.

Accordingly, in light of the foregoing, neither cited reference alone, nor the combination of references asserted by the Examiner provides the requisite teaching to render obvious or anticipate the subject matter as set forth in claims 6 and 12. The rejections of these claims should therefore be withdrawn.

C. <u>The Cited References Fail to Teach of Suggest the Claimed Invention as specified in Claims 7 and 13.</u>

Neither Chen alone nor the combination of Chen and McCartney provides the requisite teaching or suggestion for invalidating claims 7 and 13. Claims 7 and 13 are similar to claims 6 and 12 but specify only that adjacent pixels do not share two common alignment directions. Claim 13 specifies a method of manufacturing the device of claim 7.

Claims 7 and 13 specify a liquid crystal display that is comprised of a pair of transparent substrates and each of the plurality pixel regions of the display has a first alignment direction for a front alignment film portion of the pixel and a second alignment direction for a back alignment film portion of the pixel with no other alignment directions for the pixel. Furthermore, adjacent pixel regions do not share two common alignment

directions. This is illustrated in Figure 2 by the alignment directions set forth for the various pixel regions referenced by the arrows. As noted above, this is described in the specification at page 10.

As shown in the illustration, and described in the written specification, each of the referenced pixel regions has a first alignment direction for a front alignment film portion (the solid line arrows) and a second alignment direction for a back alignment film portion of the dot (the dotted line arrows) with no other alignment directions for the pixel. The claim limitation directed to the lack of any other alignment directions for the pixel distinguishes over references wherein dots or pixels are subdivided into separate regions each having their own alignment film directions. Figure 8B of the Chen reference teaches one such device wherein pixels 141 are divided in that manner which is clearly distinct from the subject matter of claims 7 and 13 at least for this reason alone.

Furthermore, claims 7 and 13 specify that adjacent pixel regions do not share two common alignment directions. This is also shown in Figure 2 wherein some of the adjacent pixels share a single common alignment direction but none of the pixels shares two common alignment film directions. For example, the two right side pixels with arrows share a single common direction (up and to the left) but none share two common directions as specified.

In contrast with the invention as specified in claims 7 and 13, the prior art Chen reference US. 6,097,463 merely teaches a divided pixel structure whereas as shown in Figures 2A and 2B, the alignment film directions for each pixel is split such that opposite alignment directions are provided within each pixel element for different portions thereof.

See specifically column 6 at lines 19-25 wherein the specification of Chen notes that in Figure 2A, the alignment directions of the liquid crystal in a pixel 24 are shown by arrows

D. In contrast, with the subject matter of claims 6 and 12, the Chen reference merely teaches splitting pixels to thereby provide multiple alignment directions within each pixel as shown in Figure 8B or Figures 2A and 2B. In an alternate arrangement, individual pixels of Chen that are adjacent have opposite alignment film directions such as shown in Figure 5A or 5B. See specifically the description in the Chen reference at column 8, lines 25-55.

Additionally, the Chen reference notes that the adjacent pixels may have the arrangement described in Figure 8A wherein adjacent pixels have a single alignment film direction and adjacent pixels are opposite. Thus, at best, Chen teaches that individual adjacent pixels may have opposite alignment film directions or that pixels may be divided as shown in Figures 2A and 2B, as well as 8B.

The significant deficiency of Chen with respect to claims 7 and 13 is that there is simply no teaching or suggestion whatsoever regarding a display wherein pixel regions each have two different alignment directions for the respective front and back alignment films and adjacent pixel regions do not share two common alignment directions. None of the embodiments in Chen provide teaching or suggestion regarding these limitations.

In each of the embodiments described in Chen, there are notable deficiencies. First, in regard to the embodiments of Figures 1-4 wherein the pixels or dots are split to have distinct front and rear alignment directions, as shown specifically in Figure 2A and 2B, all adjacent dots and pixels would each share two common alignment directions because all pixels or dots would presumably have the same two opposite orientations. The Chen reference provides no teaching or suggestion to the contrary.

In the embodiments described in Chen wherein adjacent pixels may have opposite alignment directions such as shown in Figure 5 or 8A, the device of these embodiments does

not include distinct alignment directions for the front and rear alignment films and there is no teaching or suggestion regarding modification that would so provide. Accordingly, the rejection is still improper as to these embodiments.

In regard to the embodiment of Figure 8B, there are multiple alignment directions for the front and rear alignment films but the embodiment of 8B teaches that there are more than two alignment directions for the pixel or dot. This is contrary to that portion of the claim that specifies only two distinct alignment directions for the pixel or dot and no more. Furthermore, for four closely arranged pixels illustrated in 8B there will always be pixels that share not just one but multiple alignment directions.

In summary, there are numerous deficiencies in the Chen reference. Chen merely teaches either dividing a pixel or dot or having opposite alignment directions for adjacent pixels. None of the embodiments of Chen provides the improved display device of the present invention wherein improvements in the display viewing characteristics can be achieved without degrading other performance characteristics.

The same holds true for the McCartney reference U.S. 5,657,105 that merely teaches dividing a dot into two orientation directions Col. 2 lines 50-65. There is no teaching or suggestion in this reference regarding the two distinct front and rear orientation directions and adjacent pixel regions do not share two common alignment directions. In McCartney, they all share multiple common alignment directions. This causes a problem in that the resultant display is not able to provide the improved viewing characteristics at all angles of viewing as Applicants claimed device.

Accordingly, in light of the foregoing, neither cited reference alone, nor the combination of references asserted by the Examiner provides the requisite teaching to render

obvious or anticipate the subject matter as set forth in claims 7 and 13. The rejections should therefore be withdrawn.

E. The Cited References Fail to Teach of Suggest the Claimed Invention as specified in Claim 10.

Neither Chen alone nor the combination of Chen and McCartney provides the requisite teaching or suggestion for invalidating claim 10. Claim 10 specifies a liquid crystal display that is comprised of a pair of transparent substrates and each of the plurality of dot regions of the display has a first alignment direction for a front alignment film portion of the dot and a second alignment direction for a back alignment film portion of the dot with no other alignment directions for the dot. Furthermore claim 10 requires that the liquid crystal alignment directions are in opposite directions for each of the alignment films corresponding to adjacent dots.

This is illustrated in Figure 1 by the alignment directions set forth for the various dot regions referenced by the arrows. As noted above, this is described in the specification at page 10. As shown in the illustration, and described in the written specification, each of the referenced dot regions has a first alignment direction for a front alignment film portion (the solid line arrows) and a second alignment direction for a back alignment film portion of the dot with no other alignment directions for the dot. The second alignment direction is referenced by the arrows with the broken line. The limitation directed to the lack of any other alignment directions for the dots distinguishes over references wherein dots or pixels are subdivided into separate regions each having their own alignment film directions.

Furthermore claim 10 requires that the liquid crystal alignment directions are in opposite directions for each of the alignment films corresponding to adjacent dots.

This is also shown in Figure 1 wherein the liquid crystal alignment directions are in opposite directions for each of the alignment films corresponding to adjacent dots.

In contrast with the invention as specified in claim 10, the prior art merely teaches a divided pixel structure whereas as shown in Figures 2A and 2B, the alignment film directions for each pixel is split such that opposite alignment directions are provided within each pixel element. See specifically column 6 at lines 19-25 wherein the specification notes that in Figure 2A, the alignment directions of the liquid crystal in a pixel 24 are shown by arrows D. At the very least, the Chen reference fails to anticipate claim 10 because claim 10 requires that there by different alignment film directions for the front and back alignment film portions of the dot with no other alignment directions for the dot. In contrast, the Chen reference merely teaches splitting pixels to thereby provide multiple alignment directions within each pixel as shown in Figure 8B or Figures 2A and 2B.

In an alternate arrangement, individual pixels that are adjacent have opposite alignment film directions such as shown in Figure 5A or 5B. See specifically the description in the Chen reference at column 8, lines 25-55. Additionally, the Chen reference notes that the adjacent pixels may have the arrangement described in Figure 8A. Thus at best, Chen teaches that individual adjacent pixels may have opposite alignment film directions or that pixels may be divided as shown in Figures 2A and 2B, as well as 8B. The significant deficiency of Chen is that there is simply no teaching whatsoever regarding a display wherein liquid crystal alignment directions for the respective front and back films are in opposite directions for each of the alignment films corresponding to adjacent dots.

. In each of the embodiments described in Chen, adjacent pixels may have opposite alignment directions such as shown in Figure 8A, however, in the illustrated embodiment, each pixel or dot has a single alignment direction.

The McCartney reference is also deficient with respect to claim 10 because it similarly fails to disclose independent front and rear alignment directions wherein the front and rear alignment directions for adjacent pixels are opposite. As noted above, McCartney only discloses dividing a pixel through the use of masks and apertures. See column 2 at lines 50-65.

Accordingly, in light of the foregoing, neither reference alone nor the combination of references cited by the Examiner provides the requisite teaching or suggestion to render obvious or anticipate the subject matter as set forth in claim 10. The rejection should therefore be withdrawn.

Conclusion

In light of the foregoing, Applicant submits that the rejections of all claims are improper for the reasons noted and the rejections should all therefore be withdrawn.

Respectfully submitted,

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Robert J. Depke
HOLLAND & KNIGHT LLC
131 S. Dearborn, 30th Floor
Chicago, Illinois 60603
Tel: (312) 263-3600
Attorney for Applicant

CLAIMS ON APPEAL:

1. (Previously Canceled)

2. (Previously Canceled)

3. (Previously Amended) A liquid crystal display comprising a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid crystal alignment films formed between side surfaces of said respective transparent substrates and said liquid crystal, wherein:

each of a plurality of dot regions of said display has a first alignment direction for a front alignment film portion of said dot and a second alignment direction for a back alignment film portion of said dot with no other alignment directions for said dot;

wherein four closely arranged dot regions each have two different alignment directions for the respective front and back alignment films and none of the four dot regions share two common alignment directions.

4. (Previously Canceled)

5. (Previously Canceled).

6. (Previously Amended) A liquid crystal comprising a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid

crystal alignment films formed between side surfaces of said respective transparent substrates and said liquid crystal, wherein:

each of a plurality of pixel regions of said display has a first alignment direction for a front alignment film portion of said pixel and a second alignment direction for a back alignment film portion of said pixel with no other alignment directions for said pixel.

wherein each of four closely arranged pixel regions do not share two common alignment directions .

7. (Previously Amended) A liquid crystal comprising a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid crystal alignment films formed between side surfaces of said respective transparent substrates and said liquid crystal, wherein:

each of a plurality of pixel regions of said display has a first alignment direction for a front alignment film portion of said pixel and a second alignment direction for a back alignment film portion of said pixel with no other alignment directions for said pixel;

wherein adjacent pixels do not share two common alignment directions.

8. (Previously Canceled)

9. (Previously Amended) A method for manufacturing a liquid crystal display element including a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid crystal alignment films formed between side

surfaces of said respective transparent substrates and said liquid crystal, said method comprising the steps of:

forming ultraviolet light responsive type liquid crystal alignment films over first sides of said pair of transparent substrates; and

irradiating the alignment films such that each of a plurality of dot regions of said display has a first alignment direction for a front alignment film portion of said dot and a second alignment direction for a back alignment film portion of said dot with no other alignment directions for said dot;

wherein four closely arranged dot regions each have two different alignment directions and none of the four dot regions share two common alignment directions.

10. (Previously Amended) A method for manufacturing a liquid crystal display element including a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid crystal alignment films formed between side surfaces of said respective transparent substrates and said liquid crystal, said method comprising the steps of:

forming ultraviolet light responsive type liquid crystal alignment films over first sides of said pair of transparent substrates; and

irradiating the alignment films such that each of a plurality of dot regions of said display has a first alignment direction for a front alignment film portion of said dot and a second alignment direction for a back alignment film portion of said dot with no other alignment directions for said dot;

wherein said liquid crystal alignment directions are in opposite directions for each of the alignment films at respective regions of the alignment films corresponding to adjacent dots.

11. (Previously Canceled)

12. (Previously Amended) A method for manufacturing a liquid crystal display element including a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid crystal alignment films formed between liquid crystal side surfaces of said respective transparent substrates and said liquid crystal, said method comprising the steps of:

forming ultraviolet light responsive type liquid crystal alignment films over first sides of said pair of transparent substrates; and

irradiating the alignment films such that each of a plurality of pixel regions of said display has a first alignment direction for a front alignment film portion of said pixel and a second alignment direction for a back alignment film portion of said pixel with no other alignment directions for said pixel;

wherein each of four closely arranged pixel regions do not share two common alignment directions.

13. (Previously Amended) A method for manufacturing a liquid crystal display element including a pair of transparent substrates, a liquid crystal sandwiched between said pair of transparent substrates, and liquid crystal alignment films formed between liquid crystal side surfaces of said respective transparent substrates and said liquid crystal, said method comprising the steps of:

forming ultraviolet light responsive type liquid crystal alignment films over first sides of said pair of transparent substrates; and

irradiating the alignment films such that each of a plurality of pixel regions of said display has a first alignment direction for a front alignment film portion of said pixel and a second alignment direction for a back alignment film portion of said pixel with no other alignment directions for said pixel;

wherein adjacent pixels do not share two common alignment directions.

14. (Previously Canceled).

CERTIFICATE OF MAILING

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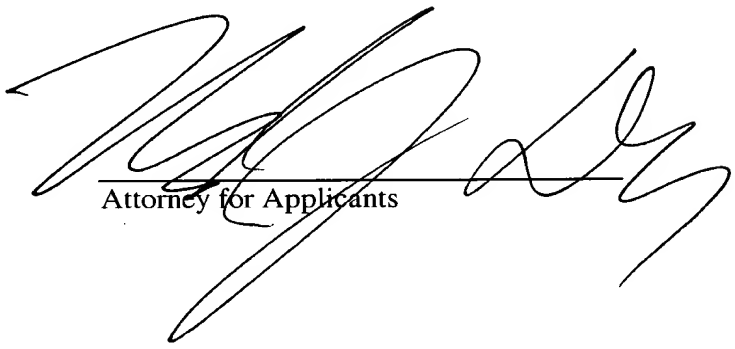

Attorney for Applicants